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(72) Inventors SIEGFRIED RICHTER and
 HANS-MARTIN SCHMIDTCHEN

(54) ELECTRICAL CABLE

(71) We, KABEL- UND METALLWERKE
 GUTEHOFFNUNGSHUTTE AKTIENGESELL-
 SCHAFT, a body corporate organised under
 the laws of Germany, of 271, Vahrenwalder
 Strasse, Hannover, Germany, do hereby de-
 5 clare the invention, for which we pray that
 a patent may be granted to us, and the
 method by which it is to be performed, to
 be particularly described in and by the
 10 following statement:—

The invention relates to an electrical
 power cable.

Known low tension power cables com-
 15 prise a plurality of plastics material in-
 sulated conductors each consisting of a
 plurality of compressed aluminium cores, the
 conductors being of either circular or sector-
 shaped cross-section. In cables of this kind
 20 damage to the insulation may remain un-
 detected for a long time if a short-circuit is
 not caused at the instant when the damage
 occurs, since, in contrast to paper insulated
 cables, plastics material insulation is not
 25 sensitive to moisture, so that even if a con-
 ductor is exposed by any damage, break-
 down of the cable does not necessarily re-
 sult.

If the conductors of a damaged cable are
 30 of copper, the cable installation is not neces-
 sarily endangered by the damage. An ex-
 posed aluminium conductor, however, cor-
 rodes in the course of time, until finally the
 conductor breaks. If the conductor is a
 phase conductor, the current path is inter-
 35 rupted and the damage becomes noticeable
 through loss of current. If, however, the
 conductor broken by corrosion is serving as
 the protective conductor, the breakage will
 not at first be noticed. Only when the pro-
 40 tective conductor is needed, for example on
 occurrence of an insulation fault in an ap-
 pliance connected to the cable, is the damage
 discovered. Hence, the cable installation can
 45 remain not electrically isolated for some
 time, so that persons coming into contact
 with the installation are in danger.

It has already been attempted to prevent
 [Price 33p]

corrosion of multi-core aluminium con-
 ductors in low tension electrical cables by
 treating the cores forming the conductor by
 impregnating the surfaces thereof next to
 50 the surrounding plastics material insulation
 with a corrosion-inhibiting, adhering wax-
 like composition which is not liable to crack.
 Apart from the fact that the application of
 55 such a composition constitutes an additional
 operation during manufacture of the cable,
 the composition does not always meet the
 demands made on it, particularly as there
 is a constant risk that it may be rubbed off,
 even during manufacture. 60

According to the invention there is pro-
 vided an electrical power cable comprising a
 plurality of conductors at least one of which
 consists of a plurality of compressed alumi-
 65 nium cores each individually covered with a
 layer of a metallic material, which material
 has a higher resistance to corrosion than
 the aluminium of said cores, the covered
 cores of the or each such conductor being
 70 contained in an individual sheath of electric-
 ally insulating plastics material.

With the cable of the invention a covering
 layer covers each core of the conductor in-
 75 dividually, and thus prevents the propagation
 of local corrosion phenomena, from one
 core to neighbouring cores. Cables accord-
 ing to the invention can, without difficulty,
 be manufactured with existing manufactur-
 ing equipment, since the construction of the
 80 cables is no different to the construction of
 an ordinary cable. Moreover, ordinary com-
 mercial terminals and connectors can be
 used on the cable of the invention, so that
 no installation difficulties arise. Preferably
 85 said covering layers are of copper. Each of
 the covering layers can consist of a thin
 copper strip formed into a tube and welded
 at the edges.

Preferably all the conductors are contained
 in a common sheath of electrically insulating
 90 plastics material.

Two embodiments of cable according to
 the invention will now be described by way

of example with reference to the drawing, in which:—

Figure 1 is a cross-section through a first embodiment;

5 Figure 2 is a cross-section through a single core used in the embodiments; and

Figure 3 is a cross-section through the second embodiment.

10 Figure 1 shows a low voltage power cable comprising four conductors 1 to 4 each of sector-shaped cross-section and each consisting of a plurality of compressed cores. As shown in Figure 2, each core 25 consists of an inner aluminium core 26 and an outer covering layer 27 of a metallic material having a higher resistance to corrosion than aluminium metallurgically bonded to the core 26. The layer 27 can consist of a thin copper strip formed into a tube and welded at the edges. The cores 25 of each of the four conductors 1 to 4 are contained in individual sheaths of electrically insulating plastics material 5, 6, 7, and 8, and the conductors 1 to 4 are all enclosed by a common plastics material sheath 9. Beneath the sheath 9 is a tape wrapping 10 which holds the conductors 1 to 4 together. Interstices between the conductors 1 to 4 contain filler threads 11 and 12. Instead of the tape wrapping 10 and the filler threads 12, an extruded coating, for example, a rubber-containing mixture, may be applied to the cable.

35 Figure 3 shows a low tension power cable comprising four conductors 13, 14, 15, and 16 each of round cross-section, and each consisting of a plurality of cores 25 as shown in Figure 2, compressed together.

40 The cores 25 of each of the conductors 13 to 16 are contained in individual sheaths of electrically insulating plastics material 17, 18, 19, 20, and are all enclosed in a common plastics material sheath 21. The sheath 21 has an outer sheath 22 disposed thereover, and both sheaths 21 and 22 may be made of a plastics material based on polyvinyl chloride. Armouring 23 is provided,

in known manner, between the sheath 21 and the sheath 22.

From the point of view of safety it is 50 sufficient for only one of the four conductors (1 to 4 in Figure 1, and 13 to 16 in Figure 3), namely the neutral or protective conductor, to be constructed in the manner described, i.e. of cores as shown in Figure 2, the other conductors being of only aluminium. 55

WHAT WE CLAIM IS:—

1. An electrical power cable comprising a plurality of conductors at least one of which consists of a plurality of compressed aluminium cores each individually covered with a layer of a metallic material, which material has a higher resistance to corrosion than the aluminium of said cores, the covered cores of the or each such conductor being contained in an individual sheath of electrically insulating plastics material. 60

2. A cable as claimed in claim 1, in which said covering layers are of copper. 65

3. A cable as claimed in claim 1 or claim 2, in which each of said covering layers consists of a thin copper strip formed into a tube and welded at the edges. 70

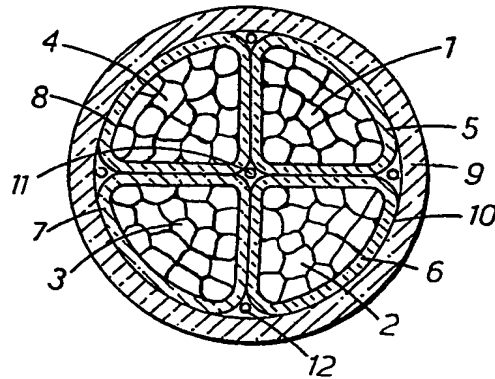
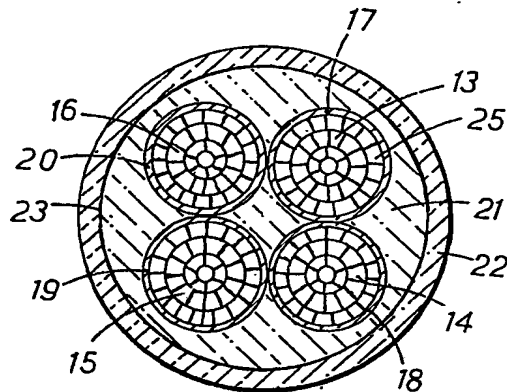
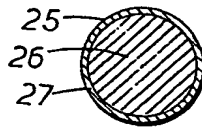
4. A cable as claimed in any preceding claim, in which all the conductors are contained in a common sheath of electrically insulating plastics material. 75

5. A cable as claimed in any preceding claim, in which the conductors are each circular in cross-section. 80

6. A cable as claimed in any one of claims 1 to 4, in which the conductors are each of sector-shaped cross-section.

7. An electrical power cable substantially as hereinbefore described with reference to Figures 1 and 2, or Figures 2 and 3 of the drawing. 85

For the Applicants,
CARPMAELS & RANSFORD,
Chartered Patent Agents,
43 Bloomsbury Square,
London, WC1A 2RA.

Fig.1.*Fig.2.**Fig.3.*